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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09 701,284	11 28 2000	Hiroyuki Kyushima	107999	8940

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EXAMINER

ZIMMERMAN, GLENN

ART UNIT PAPER NUMBER

2879

DATE MAILED: 11 01 2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/701,284

Applicant(s)

KYUSHIMA ET AL.

Examiner

Glenn Zimmerman

Art Unit

2879

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED. (35 U.S.C. § 133)
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☒ Claim(s) 4 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 November 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s) ____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4 6) ☐ Other:

DETAILED ACTION

Claim Objections

Claim 4 is objected to because of the following informalities: In claim 4 line(s) 19, the examiner suggests changing "a faceplate" to "the faceplate".

Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 4-9 are rejected under 35 U.S.C. 102(b) as being anticipated by Kyushima et al. U.S. Patent 5,504,386.

Regarding claim 4, Kyushima et al. disclose a photomultiplier tube (**title**) comprising a faceplate (**faceplate ref. 3**);

a photocathode (**photocathode Fig. 3(b) ref. 5**) for emitting electrons in response to light incident on the faceplate;

an electron multiplying section (**multiplier assembly ref. 8**), disposed inside an airtight vessel (**col. 2 line 35**), for multiplying the electrons emitted from the photocathode; and

an anode (**anode ref. 10**) for outputting an output signal based on the electrons multiplied by the electron multiplying section wherein the airtight vessel comprises;

a stem plate (**metal stem and metal annular portion ref. 4 and 11**) for fixedly supporting the electron multiplying section and the anode with stem pins;

a metal side tube (**metal sidewall ref. 2A**) with the stem plate fixed on one open end, and enclosing the electron multiplying section and the anode; and

a faceplate fixed (**faceplate ref. 3**) on the other open end of the metal side tube, wherein the stem plate is welded (**col. 4 lines 36-38**) on the one open end of the metal side tube a top surface of the stem plate contacting a bottom end of the metal side tube such that an outer surface of the metal side tube is flush with an edge surface of the stem plate, at least a portion of the top surface of the stem plate in contact with the metal side tube being formed of metal. There is an outer surface of the metal side tube that is flush with an edge surface of the stem plate as can be seen in from Fig. 3(b).

Regarding claim 5, Kyushima et al. disclose the photomultiplier tube as recited in claim 4, wherein a cutout portion is formed in the top surface on an edge of the stem plate for supporting the bottom end of the metal side tube (**metal stem and metal annular portion ref. 4 and 11**).

Regarding claim 6, Kyushima et al. disclose the photomultiplier tube as recited in claim 4, wherein the metal side tube is fusion welded (**col. 4 lines 36-38**) to the stem plate.

as to limitation fusion in claim 6, it is the process step incorporated into which renders the claim as a product-by-process.

the courts have been holding that: "- In spite of the fact that a product-by-process claim may recite only process limitation, it is the product which is covered by the claim and not the recited process steps- - . (In re Hughes, 182 USPQ 106) - -". Also - - Patentability of a claim to a product does not rest merely on a difference in the method by which that product is made. Rather, it is the product itself which must be new and unobvious. (In re Pilkington, 162 USPQ 147) - -." Accordingly, "- a rejection based on 35 U.S. C. section 102 or alternatively on 35 U.S. C. section 103 of the statute is eminently fair and acceptable." (In re Brown and Saffer, 173 USPQ 685 and 688). - - The determination of the patentability of product-by-process claim is based on the product itself rather than on the process by which the product is made- - . In re Thrope, 777 F. 2d 695, 227 USPQ 964 (Fed. Cir. 1985).

As such, no patentable weight is given to process steps recited in claim 6.

As to limitation wherein the fusion welding is laser welding or electron beam welding in claim 7, it is the process step incorporated into which renders the claim as a product-by-process.

The courts have been holding that: "- In spite of the fact that a product-by-process claim may recite only process limitation, it is the product which is covered by the claim and not the recited process steps- - . (In re Hughes, 182 USPQ 106) - -". Also - - Patentability of a claim to a product does not rest merely on a difference in the method by which that product is made. Rather, it is the product itself which must be

new and unobvious. (In re Pilkington, 162 USPQ 147) - -." Accordingly, "- - a rejection based on 35 U.S. C. section 102 or alternatively on 35 U.S. C. section 103 of the statute is eminently fair and acceptable." (In re Brown and Saffer, 173 USPQ 685 and 688). - - The determination of the patentability of product-by-process claim is based on the product itself rather than on the process by which the product is made- -. In re Thrope, 777 F. 2d 695, 227 USPQ 964 (Fed. Cir. 1985).

As such, no patentable weight is given to process steps recited in claim 7.

Regarding claim 8, Kyushima et al. disclose the photomultiplier tube as recited in claim 4, wherein the entirety of the stem plate is formed of metal (**col. 7 line 60**).

Regarding claim 9, Kyushima et al. disclose the photomultiplier tube as recited in claim 4, wherein the stem plate comprises a metal stem support member (**metal annular portion Fig. 9b ref. 11**), and a glass stem plate (**Fig. 9b ref. 9A**), the metal stem support member being in contact with the bottom end of the metal side tube extending substantially in an axial direction of the metal side tube.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kyushima et al. U.S. Patent 5,504,386 in view of Frederick et al. U.S. Patent 5,796,109.

Regarding claim 1, 2 and 3, Kyushima et al. teach a method of manufacturing a photomultiplier tube having a faceplate, a photocathode for emitting electrons in response to light incident on the faceplate, an electron multiplying section for multiplying the electrons emitted from the photocathode, an anode for outputting an output signal based on the electrons multiplied by the electron multiplying section, a stem plate for fixedly supporting the electron multiplying section and the anode with stem pins, and a side tube with the stem plate fixed on one open end and the faceplate fixed on the other open end and enclosing the electron multiplying section and the anode (**see rejection to claim 4 for all previous limitations of claim 1**), the method comprising the steps of:

providing a metal side tube (**sidewall entirely metal Fig. 3b ref. 2A**) formed of metal and a stem plate (**metal stem and metal annular portion ref. 4 and 11 respectively**) such that at least a portion contacting the metal side tube is formed of metal; aligning the metal side tube with the stem plate (**col. 4 lines 34-41; Fig. 3b**) so that an outer edge of the stem plate does not protrude further externally than an outer surface of the metal side tube; and fusing the metal side tube to the stem plate at a point of contact between the metal side tube and the stem plate by welding to form an airtight seal (**col. 2 lines 35**), but fail to teach the use of laser welding or electron beam welding. Frederick et al. in the analogous art teach a laser welding step (**col. 16 lines 8-11**). Additionally, Frederick et al. teach incorporation of such a laser welding step to improve the hermetic seal (**col. 16 lines 8-11**).

Consequently it would have been obvious to a person having ordinary skill in the art at the time the invention was made to use a laser welding step in the for the welding

step of Kyushima et al. since such a modification would improve the hermetic seal as taught by Frederick et al.

For claim 2 there is an outer surface of the airtight vessel formed from the metal side tube and the stem plate, as one can choose any outer surface that meets the requirements. None of the figures in the application meet the limitation requirement of claim 2 if the outer surface is the entire outer surface of the airtight vessel.

Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wang et al. U.S. Patent 4,221,967 in view of Kyushima et al. U.S. Patent 5,504,386.

Regarding claim 10, Wang et al. teach a radiation detector **(title)** comprising: a scintillator **(scintillation screen Fig. 1 ref. 24)** for emitting fluorescent **(output phosphor screen ref. 46)** light in response to radiation generated from an object of analysis;

a plurality of photomultiplier tubes **(photomultiplier tubes ref. 50)**, each having a faceplate **(glass output window ref. 30)** disposed in opposition to the scintillator, for outputting electric charges based on fluorescent light emitted from the scintillator; and

a position calculating section **(position network ref. 52)** for performing calculations on the electric charges output from the plurality of photomultiplier tubes and outputting positioning signals of radiation issued in the object of analysis, but fail to teach a photomultiplier tube comprises: a photocathode for emitting electrons in response to light incident on the faceplate; an electron multiplying section, disposed inside an airtight vessel, for multiplying the electrons emitted from the photocathode; and

an anode for outputting an output signal based on the electrons multiplied by the electron multiplying section, and wherein

the airtight vessel comprises;

a metal stem plate for fixedly supporting the electron multiplying section and the anode with stem pins;

a metal side tube with the metal stem plate fixed. Kyushima et al. in the analogous art teach wherein each of the plurality of the photomultiplier **(title)** tubes comprises: a photocathode **(photocathode Fig. 4b ref. 5)** for emitting electrons in response to light incident on the faceplate; an electron multiplying section **(multiplier section ref. 8)**, disposed inside an airtight vessel **(col. 2 line 35)**, for multiplying the electrons emitted from the photocathode; and

an anode **(anode ref. 10)** for outputting an output signal based on the electrons multiplied by the electron multiplying section, and wherein

the airtight vessel comprises;

a metal stem plate **(metal stem ref. 4)** for fixedly supporting the electron multiplying section and the anode with stem pins **(stem leads ref. 6)**;

a metal side tube **(metal side wall ref. 2a)** with the metal stem plate fixed

Additionally, Kyushima et al. teaches incorporation of such a photomultiplier tube to improve the reduction of noise and improve manufacturing efficiency.

Consequently it would have been obvious to a person having ordinary skill in the art at the time the invention was made to use the photomultiplier of Kyushima et al. in

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the gamma ray camera of Wang et al. since such a modification would improve the reduction of noise and improve manufacturing efficiency as taught by Kyushima et al.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Butterwick U.S. Patent 4,426,596 disclose a Photomultiplier Tube Having a Heat Shield with Alkali Vapor Source Attached Thereto. Cawein U.S. Patent 2,416,376 disclose a Variable Gain Electron Multiplier. Cawein U.S. Patent 2,418,574 disclose an Electron Multiplier.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Glenn Zimmerman whose telephone number is (703) 308-8991. The examiner can normally be reached on M-F.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimesh Patel can be reached on (703) 305-4794. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7382 for regular communications and (703) 308-7382 for After Final communications.


Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is n/a.

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Glenn Zimmerman
October 19, 2002


ASHOK PATEL
PRIMARY EXAMINER